QUARTERLY SUMMARY

OF THE

IMPROVEMENTS AND DISCOVERIES

IN THE

MEDICAL SCIENCES.

ANATOMY AND PHYSIOLOGY.

1. *On the Structure of the Muscular Substance of the Heart.*—The following important observation is by **Remak**. The facts observed by him are best seen in the thin muscular layers which can be procured, especially in sheep, from the commencement of the great veins of the neck or the pulmonary veins. Two sets of muscular fibres can be distinguished; some which run parallel, and others which are between these and interlace, connecting the adjoining parallel fibres to each other. The network formed by the connecting or intermediate fibres differs in complexity in the different parts of the heart, auricles, ventricles, &c. Sometimes, instead of these intermediate connecting fibres, the sides of two parallel running fibres approach and fuse into each other (*eine partielle Verschmelzung der Ränder zweier Hauptfasern*). The intermediate fibres are often much smaller than the parallel, and of variable strength; occasionally, as in the ventricles, they are as large as the parallel fibres; it is then very difficult to make out the arrangement; yet in no place, either in the auricle or ventricle, is this arrangement wanting. This observation of Remak's has been confirmed in Wurtzburg by Virchow.—*Med. Times*, Sept. 7, from *Müller's Archiv.*, 1850. No. II.

2. *The Terminations of the Olfactory Nerve.*—Dr. **Hox** describes the terminations of the olfactory nerves as being easily seen by taking a piece of a frog's nasal mucous membrane, placing it between glass, and examining it with a power of from + 216 to + 300. The extremities of the nerve-fibres, sometimes dilated and forming club-shaped processes, can be seen at their extremities, winding round and sometimes returning to the parent branch. Besides these, other nerves with broad diameters are seen passing in various directions, and present the characters of fine cerebral fibres.—*Med. Times*, Sept. 7, from *Müller's Archiv.*, 1850. No. II.

3. *On the Structure and Physiological Uses of Peyer's Glands.* By **Ernest Brucke**.—In the autumn of 1849, Brücke made some attempts to inject the most minute lymphatics of the bowels, by forcing oil of turpentine, coloured with alkanet root, into a portion of the intestinal tube of the cat. After the pressure on the piston of the syringe had been for a short time maintained, he observed that some of the lymphatics of the mesentery became filled, and that the coloured oil passed through the so-called *pancreas-asellii;* and finally reached the *receptaculum chyli* and thoracic duct. On more minute examination, it was found that the only trunks of the lymphatic system injected were those which took their origin from the neigbourhood of the glands of Peyer. These trunks were formed by the union of minute arborescent branches, which obviously ran on the surface of the bowel, and whose finest twigs proceeded from

the glandular patches. A reddish tinge was distinguishable in the interior of some of the small glands, but was more distinct in the narrow interstices between them. Brücke supposed that by distending the cavity of the bowel, he had succeeded in rupturing the capsules of Peyer's glands, and that the injection had, through these breaches, passed into the lymphatics. This view was confirmed by other experiments, in which a column of fluid was substituted for the injecting syringe. There was no extravasation; and the uniform way in which the injection ran, commencing in a reddish point in the gland, and then proceeding by minute channels to form an arborescent network, terminating in trunks, which proceeded through the mesentery, seemed to indicate that the fluid passed by natural canals. The success of these injections suggested the inquiry, how far the glands of Peyer resembled lymphatic glands. Brücke was aware of the views on the structure of lymphatics held by Professors Ludwig and Noll, of Zurich, which the former had shortly before communicated to him. "Each vas inferens," writes Ludwig, "before entering a gland divides into numerous small twigs, each of which, on piercing the *membrana propria* of the gland, loses its coats, and pours its contents into the cavity of the gland, which is traversed with delicate and incomplete septa of fibrous tissue, and filled with all kinds of lymph-corpuscles. The vas efferens is formed in like manner by the reunion of minute twigs." On examining Peyer's glands, Brücke found great numbers of lymph-corpuscles, cytoblastsand cells, undistinguishable from the contents of ordinary lymphatic glands. It remained to trace, with the assistance of the microscope, the supposed connection of Peyer's glands with the lymphatic system. He found that many of these glandules presented, on their side next the peritoneum, a prolongation, ending in a delicate bundle of fibrous tissue, attached to the capsule of the gland. These bundles, after the addition of acetic acid, were seen to contain dark nuclei, similar to those observed in the glands themselves. No trace of a vessel was seen within the bundles, unless the fibres themselves were arranged so as to form a sort of tube. Brücke points out that similar bundles of fibres are connected with the villi, and argues that they must be the channels by which the lymph is conveyed from the villi to the trunks of the lymphatic system. Whether each bundle forms a conduit for the chyle, or whether the fluid insinuates itself betwen the individual fibres, drawing along with it the nucleated and fatty elements of the chyle, may admit of question. Brücke thinks that the whole so-called "submucous tissue" consists of these bundles and connecting fibres, with nothing in the shape of a vessel, except the blood passages.

He concludes his very interesting memoir as follows:—"It is ascertained, 1. That the chyle ducts may be injected through the glands of Peyer, and that observation of the course followed by the fluid injected proves that it passes in natural and not in forced channels. 2. That the cytoblasts which fill Peyer's glands are like those in the mesenteric glands; and during resorption form cells resembling the lymph-corpuscles. 3. That Peyer's glands are connected with thread-like structures, resembling those proceeding from the villi, and constituting the passages for the chyle; for in the submucous tissue nothing else which could serve such a purpose has been detected; and a system of vessels, proceeding from sources so numerous as the villi, and of course containing such a mass of fluid, could not have escaped observations such as have been recently made.

"The opinion which I pronounce, that Peyer's glands are lymphatic glands, situated in the wall of the intestine, and destined to elaborate the first organized elements of the chyle, may be erroneous; for almost all physiological conclusions, founded upon morphological investigations, attended with great difficulties, and not satisfying all conditions of inquiry, may lead to error; but I consider that the extent and the results of my inquiries have been such that I am entitled to submit an opinion, upon the correctness of which other observers may decide."—*Month. Journ. of Med. Sci.* Nov., 1850, from *Ueber den Bau und die Physiologische Bedeutung der Peyerischen Drüsen. Von Ernest Brücke. Wien*, 1850.

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4. *Of Repair and the Imperfections or Limitations of Cure.*—Dr. WILLIAM ADDISON, in an interesting paper "On the Containing-texture of the Blood," makes the following important remarks relative to repair of injuries in the organism:—

"The characteristic pittings of small-pox, and the analogous marks which may be found remaining after a severe application of antimonial ointment to the skin, not only point out upon what texture the morbid action has been concentrated, but they indicate—as do the scars and seams of a burn—that the parenchyma of the glandulæ is not restored or reconstructed by the process of repair, which fills the void, not by restoring the destroyed or lost form, but with simple fibrous tissue. Pathological anatomy has long demonstrated analogous facts in the mucous membranes; and it appears from our observations in these and other examples of repair or cure, where an original or germ-form has been destroyed, that, with the original form and substance, *the principle* governing the natural distribution of the blood-vessels has also departed; for the arrangement or disposition of these in a scar or a cicatrix, in granulations and lymph, appears to us never to be the same as it was in the unimpaired original growth. Such being the facts, we have, in these instances at least, no evidence of a repetition or revival of the 'germ force.' On the contrary, we see only effects arising from those qualities of blood which, wherever blood extends, originate a limiting or bounding texture, a correlative of blood, the first phase of which is *corpuscular*, and the concluded form *fibrous*. These imperfections or limitations of cure in the skin may be of little consequence to the welfare of the person; but in mucous membranes and internal organs they become of much more importance: and allied to these in their consequences upon the general or constitutional health are the unnatural fibrous adhesions which very frequently attend the cure of severe inflammation on the free surfaces of fibrous membranes. But we have elsewhere spoken at length upon this part of our subject,* and are, therefore, content with the following summary:—

"The first phenomenon of repair is inflammation, cells, and cell-growth interpolating fibrous texture. The second phenomenon of repair is the cure of inflammation; natural fibrous forms abolish and exclude the cell-growth period. But there is often a pause between these two periods. Inflammation subsides, but cure does not advance: unnatural cell-growths maintain their footing, but they do not spread. *This is scrofulous disease*—a persistent form of retrograde metamorphosis.

"Finally, the human body, regarded *analytically*, is composed of three great systems of organs—sentient, motor, and secreting—nourished by the circulation of the blood, and sustained by the coherency of textures, correlatives of blood. In this point of view we have sought to determine the seat of inflammation, and to extricate its definitive phenomena from their complications with the elements and physiology of the parenchymatous substances. Desirable as this is on many grounds, particularly as interpreting pathological appearances, we must remember that analytical views are unsatisfactory in the practical treatment of disease; because, in the first place, such is the minuteness of the scale upon which different physiological substances commingle and are co-ordinated, that there are everywhere in the living structure, *and within microscopic areas*, elements of the common and of the specific: so that if disease fundamentally begin in the one, it affects the other before it can become an object of practical interest or regard: and in the second place, *synthetically* viewed, all the various elements of the living body are so mutually incorporated and interdependent, that the whole of them form but one person. Look at the relations between *sentient* and *motor* elements. Muscles act instantaneously upon the dictates of the will; but disturb sentient matter, and muscles are divorced from the dominion of the will; they remain quiescent, and waste away. Are not muscles, then, exquisitely sensitive? *Sentient* and *motor* elements are both incorporated with the simple fibres of the *fibrous tissues*, and immediately feel the influence of the first inroads of inflammation. In the deep interior of the brain *sentient elements* are brought into such close and mysterious relations with the *elements of blood*, that the ordinary form and character of the limiting tissue of the blood is dispensed with, a kind of embryonic type of circulation here prevailing. Blood and medullary matter seem in this instance to have nothing interposed between them. In the *secreting organs, and within micro-*

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* Healthy and Diseased Structure, part ii., ch. 2.

scopic areas, multitudes of the *secreting cell-particles* are attached to the *containing texture of the blood;* and in the liver the same continuous relations are thought by the best anatomists to prevail between the *secreting elements* and the *venous blood,* as appear to exist in the brain between *sentient elements* and *arterial blood.* It is these synthetical relations which prove to us how dependent every part of the body is upon the circulation of blood, and deprive analytical investigations of the extensive influence which otherwise they must have had upon the art of therapeutics. In the embryo, *germ-masses* or groups of sentient, motor, and secreting elements are founded prior to the flowing of the blood-current, but the growth of blood-vessels, of fibrous textures and bones, upon which the relations of forms and functions depend, is posterior to the circulation; and the healthy constitution of these textures hinges upon a normal metamorphosis of the elements of blood. Such being the facts, what, then, replenishes and maintains the circulating fluid?

"In answering this question, we enter upon another and a widely different sphere.

"Food, drink, and air, incorporate with blood. Here we pass from the department of the living body to the world of external nature: and it is to be observed that the elements of the one cannot be said to be *more necessary to the phenomena* of life and health than are those of the other; for the body dies as soon deprived of air as it does deprived of blood."—*Lond. Med. Gaz.*, Sept. 20th, 1850.

ORGANIC CHEMISTRY.

5. *On the Salts contained in Cholera Evacuations.* By Dr. GUTERBOCK.—The following are the author's conclusions, drawn from the chemical examination of the stools in cholera:—

1. A most remarkable circumstance is the large proportion of water, amounting, on an average, to 98.119; while, according to Berzelius, normal stools contain 75.3. The specific gravity, too, is remarkably low, varying from 1006 to 1008; the urine itself, in but few diseases, manifesting so low a one. 2. The solid constituents amount on an average to but 1.581. 3. Among these, the inorganic *salts* constitute by far the largest portion—upon an average 4-5ths, the organic matter being only 1-5th—a proportion that is the reverse of the normal, in which the organic parts form 19-20ths according to Berzelius, and 9-10ths according to Rose. 4. Among these salts the most remarkable is the *chloride of sodium*, constituting, upon an average, nearly ½, and, in some cases, 2-3ds, of the whole. The cholera stools contain nearly ⅓ per cent. on an average, while, according to Berzelius, the normal proportion is but 0.28; and according to the latest analysis of solid excrement, by Rose and Fleitmann, this proportion is even unusually large, as in 100 parts of the entire salts, only 1-58th were chloride of sodium. Thus the cholera stools contain a hundred times as much salt as the normal; and, indeed, so considerable is the quantity that, after the evaporation of the fluid, the unassisted eye recognizes the characteristic crystals. 5. Next to this the *carbonate soda* is most abundant, and besides these are some phosphate of magnesia and lime, and a trace of the sulphate. The absence of *potass* in the stools is remarkable, forming, as it does, a chief saline constituent in the normal solid stools. According to Rose and Fleitmann, these contain 22.49 per cent., while in the cholera stool only a trace is detectible. 6. The organic matters of cholera stools consist in great part of mucus and the remains of epithelium, and it has generally been believed that they are rich in albumen. The experiments of the author and of Corenwinder contradict this, for they either found it entirely absent, or mere traces present. Masselot (*Gaz. Méd.*, *No.* 14, 1849) states that he found a considerable quantity; but as the stools were compared to soup in colour they probably contained blood—an important point to be borne in mind during investigations for albumen. In almost all cases a small quantity of casein is present, especially in stools removed after death. 7. The abdominal discharges were always alkaline, but the *vomits*